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Tattoos among elite football players during the 2019 FIFA Women's World Cup France

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Thirty-four percent of the men players harbored visible tattoos, without notable impact on performance or discipline on the field during the 2018 FIFA World Cup (FWC), [1]. In a spirit of gender equality, we performed the same study among elite women footballers enrolled in the 2019 FWC France with the same methodology [1]. Players' visible tattoos (location, colours) were reviewed using the Getty Images website [2]. We collected players and teams' statistics using the official FIFA website [3].

Among the 552 enrolled players (median age 26 years), 164 (29.8%) had visible tattoos (upper limbs, 99%; head and neck, 11%; lower limbs, 7.3%; black/grey tattoos, 85%). There were no significant differences regarding age or player's position (**Table 1**). Players from Latin America had the highest prevalence of visible tattoos (56.5%). African players displayed significantly more head and neck tattoos than Europeans (28.6% vs 6.3%, $p=0.034$) (**Table 2**). The prevalence ranged from 60.9% (Brazil) to 0% (Japan).

The number of scorers, the mean number of goals scored, and the proportion of players with yellow/red cards were similar between tattooed and non-tattooed players (**Table 1**). There was no correlation between having tattoos and number of goals scored (Spearman rho 0.029, $p=0.562$). We found no differences between tattoos, players' positions and yellow/red cards (*data not shown*).

Out of the 24 enlisted teams, 16 qualified for the knockout stage: 66% of the tattooed players qualified (108/164). The mean number of tattooed players in teams that qualified for the knockout stage and in those which did not was similar (7.0 ± 3.9 vs 6.7 ± 3.9 , $p>0.05$). There was no difference between the final four teams (USA, the Netherlands, Sweden and England) and the other teams (7.7 ± 1.5 vs 6.7 ± 4.1 , $p>0.05$). We failed to find any correlation on a team level between the prevalence of tattooed players and performance (total scored goals, total goals against, shots, attempts on target, goal/attempts ratio) or discipline (total yellow and red cards, fouls committed or fouls/game ratio).

Twenty-three penalties were scored (out of 33, 69.7%) during the FWC. The success and saving rate was similar between non-tattooed and tattooed shooters/goalkeepers (**table 1**).

Almost 30% of the women football players had visible tattoos during the 2019 FWC France. This proportion is similar to the prevalence in the general population for the same age range (25-34 y, 27.3%) [4]. We found similarities between women and men footballers in 2018 regarding the overall prevalence (34%), black tattoos (85% vs 83%), the proportion of tattooed scorers (34.9% vs 40%) and of goals scored by tattooed players (36% vs 37%) [1]. We found no association with discipline, team and personal performance, including penalties success or fail [5].

Visible tattoos are also popular in national women football teams. We collected visible tattoos but players may have additional tattoos on the upper body (chest, back, shoulders, groins or feet). We may have missed small visible tattoos. Besides, some footballers play with upper long sleeves (n=28), goalkeepers especially (n=24). Therefore, the prevalence of tattoos is most likely higher. Besides, the number of games by team is low (from 3 to 7) and 110 players (19.9% of all the players) did not have any playing time, which may have an impact on performance and discipline. Lastly, we did not analyze size, number or design of the tattoos. We had the *impression* that women favored smaller and discrete tattoos, compared to male players who displayed more often extensive tattooed sleeves. As for men [1,5], having tattoos did not seem to provide any individual advantage or disadvantage on the field for women footballers at that level of competition.

References

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Tables

Table 1. Characteristics of tattooed versus non-tattooed footballers during the 2019 FIFA World Cup France (n=551*)

	Players with tattoos <i>n</i> =164	Players without tattoos <i>n</i> =387	Fisher's exact test or Student t-test p-value
Mean age (SD)	26.4 (4.0)	25.9 (4.1)	NS
Geographical distribution, <i>n</i> (%)			
Europe (<i>n</i> = 207)	62 (29.9)	145	Reference
Americas (<i>n</i> = 138)	59 (42.7)	79	0.016
North America (<i>n</i> = 69)	20 (30.0)	49	NS
South America (<i>n</i> = 69)	39 (56.5)	30	0.0001
Asia (<i>n</i> = 92)	12 (14.1)	80	0.0014
Africa (<i>n</i> = 69)	14 (20.3)	55	NS
Oceania (<i>n</i> = 45)	17 (37.8)	28	NS
Field position, <i>n</i> (%)			
Forward (<i>n</i> = 139)	44 (31.6)	95	Reference
Midfielder (<i>n</i> = 163)	54 (33.1)	109	NS
Defender (<i>n</i> = 178)	51 (28.8)	126	NS
Goalkeeper (<i>n</i> = 72)**	15 (20.8)	57	NS
Goals, <i>n</i> (%), total <i>n</i>=413***			
	Players with tattoos <i>n</i> =133	Players without tattoos <i>n</i> =280	
Total scored (<i>n</i> = 138)	50 (36.2)	88 (63.8)	-
Number of scorers (<i>n</i> = 83)	29 (21.8)	54 (19.3)	NS
Ratio by field players	0.21	0.19	-
Mean number (SD)	0.38 (0.94)	0.31 (0.81)	NS

Penalties, <i>n</i> (%), total <i>n</i> =33****			
Penalties taken	16	17	-
Penalties scored	11 (68.7)	12 (70.6)	NS
Penalties prevented by goalkeepers*****	3 (27.3)	7 (31.8)	NS
Disciplinary, <i>n</i> (%), total <i>n</i> =442*****			
	Players with tattoos <i>n</i> = 141	Players without tattoos <i>n</i> = 301	
Players with any cards	34 (24.1)	79 (26.2)	NS
Players with yellow cards	33 (23.4)	77 (25.8)	NS
Players with red cards	1 (0.7)	3 (0.9)	NS
Number of yellow cards (<i>n</i> = 124)	41 (33.0)	83 (66.9)	-
Mean number of yellow cards (SD)			
Numbers of red cards (<i>n</i> = 4)	0.29 (0.58)	0.28 (0.49)	NS
	1 (25)	3 (75)	-
Mean number of red cards (SD)			
	0.01 (0.08)	0.01 (0.10)	NS

NS: Not significant; SD: Standard Deviation

*1 player from New Zealand had no picture available.

** Upper long sleeves

***Goalkeepers excluded (*n*=29) and players who did not played any game excluded (*n*=110)

****Five goalkeepers played with upper long sleeves ("non-tattooed"). Even if we excluded them, the difference remains not significant (*p*>0.05).

*****includes saves by the goalkeepers and missed shots by the shooter

*****Players who did not played any game excluded (*n*=110)

Table 2. Tattoos by location on body parts and geographic area among women footballers during the 2019 FIFA World Cup France

Continent (total players)	Arm <i>n</i> (%)	Lower limb <i>n</i> (%)	Head and neck <i>n</i> (%)	Fisher's exact test p-value
Europe (<i>n</i> =62)	62 (100)	4 (6.3)	4 (6.3)	Reference
Americas (<i>n</i> =59)	58 (98.3)	4 (6.8)	10 (16.5)	NS
North America (<i>n</i> = 20)	20 (100)	1 (5)	3 (15)	NS
South America (<i>n</i> = 39)	38 (97.4)	3 (7.7)	7 (17.9)	NS
Africa (<i>n</i> = 14)	13 (100)*	3 (21.4)	4 (28.6)	0.034**
Asia (<i>n</i> = 12)	12 (100)	-	1 (8.3)	NS
Oceania (<i>n</i> = 17)	17 (100)	1 (5.9)	-	NS
Total (<i>n</i> = 164)	162 (99)*	12 (7.3)	19 (11.6)	NS

NS: Not significant

*A south African player with head and neck tattoo played with long sleeves

**p=0.034 for head and necks tattoos. NS for lower limbs tattoos.